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Abstract:

This paper provides a comparison of successful and financially distressed producers based on the data from more than 400 individualized financial analyses. These objective variables are combined with subjective observations of management styles and attitudes to provide unique identification of the factors most influential in the success of Texas producers.

Farm management consultants, management economists and others present discussions of the factors that affect business success. Generally, numbers one and two on the list would be: 1) debt load and 2) profitability. While few would disagree that these two factors are important, it would be helpful to know if these are really the most important. And, if there are other factors that we might be missing. A study of primary data collected from producers is needed for analysis to uncover the factors most important to business success. The objective of this study is to identify the factors that are most common to successful agricultural producers in Texas.

In Texas, the Financial and Risk Management Assistance program (*FARM Assistance*) is a unique combination of a state-of-the-art computerized decision-support system and extension risk management specialists working one-to-one with producers to provide individualized economic and risk assessment evaluations. Alternative management plans and new technologies can be analyzed relative to their risk impacts on the financial condition of the operation over a

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ten-year planning horizon. The intent of the FARM Assistance program is to enhance the capacity of agricultural decision makers to make informed choices of risk management strategies for long-term survival and profitability.

While the FARM Assistance program is relatively new, over 400 individual producer analyses have been completed across the state from 1998 to 2002. The program has been able to help producers add to their bottom lines by analyzing the impacts of alternative management plans before the plans are implemented. The resulting database of primary data collected from producers is a rich source of data to use to uncover the most important factors for business success. Data collected through the FARM Assistance program includes an extensive list of input parameters representing crop and livestock production, size of operation, land lease arrangements, cost of production, asset values, debt structure, farm program information, crop insurance information, and non-farm income and expenses. In addition to this empirical data, extension risk management specialists have observed management styles and traits of the producers that participate in the program. These input parameters define an operation's current financial performance and position, as well as the framework for projected performance.

The FARM Assistance program projects the financial performance and position of an operation ten years into the future. Obviously, there are operations that project to be profitable and improve their equity position over time, as well as unprofitable operations that lose equity into the future. Of particular interest is identifying current observable factors that are most relevant in predicting future success. The first step in this process is defining future success. For the purpose of this study an arbitrary success index was developed and each of 375 farms is assigned a success index value. In general a successful farm or ranch operation is one that generates profit and improves its real net worth position. Another achievement of successful operations is the ability to maintain a healthy cash flow position mitigating liquidity risk. Each

of these three financial performance criterions is included in a FARM Assistance projection. Therefore, the data is available to include each in an overall index of success. Profit is measured by the ten-year average Return on Assets. The annual percent change in real net worth, averaged for the ten-year projection period is used to measure equity growth. The average probability of cash flow deficits measures the liquidity risk of the farm or ranch. An annual cash shortfall is typically refinanced and added to the following year's operating note. Therefore, we also refer to this measure as the probability of refinancing carry over debts. The index of success is defined by:

$$\text{Success} = \text{ROA} + \% \Delta \text{RNW} + 0.5 * \text{Prob}(\text{cash} < 0)$$

Table 1 contains the average, minimum, and maximum success values for different groups of FARM Assistance subscribers. The average success index value for all 375 farms is

Table 1. Success Index* by Farm Groups

Factor	All	Ranked by Success Index			Crops ¹	Livestock ²	Diversified ³
		Top	Middle	Bottom			
Number of Farms	375	125	125	125	278	47	50
Average Success Index	4.3	23.8	7.8	-18.8	7.6	-12.4	1.6
Maximum Success Index	59.5	59.5	12.5	2.3	59.5	22.2	49.1
Minimum Success Index	-84.5	12.6	2.3	-84.5	-76.8	-74.6	-84.5

* Success Index = AvgROA + Avg%ChangeRNW - 0.25(Probability of Ref.)

1 Crop sales account for more than 75% of all farm receipts

2 Livestock sales account for more than 75% of all farm receipts

3 Farm can not be classified as primarily crop or livestock

4.3 with the most successful farm achieving a 59.5 value and negative 84.5 representing the least successful operation. The operations are divided into three success categories. The top third of the operations, rank by success index, has an average index value of 23.8, and an average success index of 7.8 and negative 18.8 represent the middle and bottom thirds respectively. In terms of percentile rankings, the 33rd percentile is a 2.3 index value and the 66th percentile is a 12.5 success index. The operations are also categorized by production type. The majority of the

375 operations are classified as crop farms. 278 of the operations have 75% or more of receipts coming from crop activities. Likewise, a livestock operation is defined as a ranch that produces 75% or more of total receipts from livestock sales. Operations with less than 75% from either crops or livestock were classified as diversified. Crop farms have the highest projected performance with an average index of future success of 7.6 followed by 1.6 and negative 12.4 for diversified and livestock producers respectively.

Another way to analyze the performance of the different types of producers is to compare the composition of the entire sample of 375 farms to the make up of the top, middle, and bottom performance categories. Table 2 contains the composition of the performance groups, and provides further evidence of the superior financial outlook for crop farms. Almost 75% of the

Table 2. Composition of Performance Groups

	All	Ranked by Success Index*		
		Top	Middle	Bottom
<i>Number of Farms</i>	375	125	125	125
Crops ¹	74.1%	87.2%	72.8%	62.4%
Livestock ²	12.5%	1.6%	12.8%	23.2%
Diversified ³	13.3%	11.2%	14.4%	14.4%

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farms are crop farms with the other 25% split between livestock and diversified operations. The middle performance group maintains a very similar make up to the entire sample of producers. The diversified operations, which make up 13.3% of all operations, are represented similarly in each of the performance categories with 11.2% to 14.4% representation. Livestock producers are under-represented in the highest success group, accounting for less than 2% of the 125 top performers. While 12.5% of all operations are classified as livestock, the lowest performance group is made up of 23.2% livestock operations. The representation of crop farms is highest in

the third most successful group with 87%, 73%, and 62% respectively for the top, middle, and bottom performance groups.

With a quantitative measure of future success, the relative importance of various current factors can be easily measured. Table 3 shows the average value for various financial factors for operations of different production types and performance levels. Most of the factors follow traditional logic. The most successful operations have the highest net cash farm income and the lowest expense-to-receipts ratio. These should be expected given that efficiency and profitability drive one of the variables, return on assets, in the determination of success.

Table 3. Average Financial Factors by Farm Groups

Factor	All	Ranked by Success Index			Crops ¹	Livestock ²	Diversified ³
		Top	Middle	Bottom			
<i>Number of Farms</i>	375	125	125	125	278	47	50
2002 NCFI / Acre	\$58	\$114	\$44	\$16	\$72	\$6	\$27
2002 NCFI Standard Deviation	\$73	\$104	\$58	\$59	\$82	\$47	\$51
2002 Crop Receipts / Acre	\$205	\$296	\$169	\$149	\$250	\$23	\$105
2002 Expense / Receipts	0.73	0.66	0.72	0.82	0.71	0.82	0.77
2002 Interest Exp / Receipts	0.08	0.06	0.07	0.11	0.07	0.08	0.09
2002 Depreciation / Receipts	0.08	0.07	0.09	0.08	0.08	0.10	0.09
2002 Real Estate Investment / Acre	\$312	\$229	\$390	\$316	\$297	\$275	\$434
2002 Equipment Investment / Acre	\$192	\$214	\$196	\$166	\$226	\$42	\$140
2002 Long Term Debt / Acre	\$67	\$81	\$75	\$47	\$71	\$36	\$76
2002 Intermediate Term Debt / Acre	\$46	\$66	\$40	\$32	\$53	\$17	\$36
2002 Debt / Assets	30.9%	30.4%	25.7%	36.4%	30.0%	29.8%	37.0%
2002 Family Living Expense	\$32,640	\$30,998	\$34,158	\$32,693	\$34,610	\$29,020	\$22,644
2002 Off-Farm Income	\$10,388	\$7,993	\$12,728	\$10,443	\$10,067	\$10,293	\$12,262
10yr Projected Avg Probability of Refinancing	27.8%	8.6%	12.4%	62.2%	23.6%	47.2%	32.8%
10yr Projected Avg ROA	7.2%	13.9%	6.3%	1.5%	8.3%	2.0%	6.0%
10yr Projected Avg % Change in RNW	4.0%	12.1%	4.6%	-4.7%	5.1%	-2.6%	3.8%
Success Index*	4.3	23.8	7.8	-18.8	7.6	-12.4	1.6

* Success Index = AvgROA + Avg%ChangeRNW - 0.25(Probability of Ref.)

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However, several interesting factors are revealed. The top performing producers have the highest risk as measured by the projected standard deviation of net cash farm income. At the same time this group carries adequate liquidity such that they have the lowest risk, 8.6%, as measured by the probability of incurring a cash deficit. The middle performance group has the lowest debt level with a 25.7% debt-to-asset ratio. The top third achieves the higher level of success with a 30% debt level, while the bottom third carries a 36% debt load. The most

successful operations have the least amount invested in real estate per acre, suggesting that the group operates on less expensive land and/or leases a larger portion of its productive acres relative to the less successful farms and ranches. Non-farm income and expenses appear to have little impact on the level of success. Both family living expenses and off-farm income are similar across the three performance groups.

The importance of the various current factors in predicting success can be measured by calculating the correlation coefficient between the current indicator factor and the projected index of success. Table 4 ranks the relative importance of current factors by the absolute value of the correlation coefficient calculated across all farms. For all farms the factors most

Table 4. Financial Factors and Correlation to Success for All Farms and Ranches

Factor	Rank	Correlation	t-statistic*
Expense / Receipts	1	-0.535	12.245
NCFI / Acre	2	0.389	8.145
Debt / Assets	3	-0.299	6.046
Interest Exp / Receipts	4	-0.254	5.062
Crop Receipts / Acre	5	0.191	3.751
NCFI Standard Deviation	6	0.180	3.542
Intermediate Term Debt / Acre	7	0.118	2.297
Equipment Investment / Acre	8	0.108	2.091
Long Term Debt / Acre	9	0.076	1.481
Real Estate Investment / Acre	10	-0.044	0.842
Depreciation / Receipts	11	-0.040	0.772
Family Living Expense	12	-0.020	0.390
Off-Farm Income	13	0.006	0.107

*Bold t-statistics are significant at 95%

correlated to success are measures of current efficiency, profitability, and debt level. The ratio of expense-to-receipts ranks number one for all farms followed by net cash farm income per acre and the debt-to-asset ratio. Eight of the thirteen factors were significantly correlated to the success index.

The same procedure was used to rank the factors for each of the three types of producer groups. Tables 5, 6, and 7 contain the factor rankings for crop, livestock, and diversified operations. The top three factors for all farms also rank high for the production specific groups, but a few differences are revealed in the different groups. The standard deviation of the net cash farm income has a significant positive correlation to success for crop farms and ranks as the fourth most important factor. However, the same risk measure is not a significant factor for livestock or diversified operations.

Table 5. Financial Factors and Correlation to Success for All Crop Farms**

Factor	Rank	Correlation	t-statistic*
Expense / Receipts	1	-0.447	8.305
NCFI / Acre	2	0.372	6.663
Interest Exp / Receipts	3	-0.278	4.808
NCFI Standard Deviation	4	0.249	4.279
Debt / Assets	5	-0.244	4.188
Crop Receipts / Acre	6	0.166	2.800
Intermediate Term Debt / Acre	7	0.083	1.382
Off-Farm Income	8	-0.082	1.364
Real Estate Investment / Acre	9	-0.078	1.299
Depreciation / Receipts	10	-0.056	0.930
Long Term Debt / Acre	11	0.046	0.766
Family Living Expense	12	-0.013	0.217
Equipment Investment / Acre	13	0.009	0.146

*Bold t-statistics are significant at 95%

**Crop sales account for more than 75% of all farm receipts

Table 6. Financial Factors and Correlation to Success for All Livestock Operations**

Factor	Rank	Correlation	t-statistic*
Expense / Receipts	1	-0.721	6.986
Debt / Assets	2	-0.678	6.192
NCFI / Acre	3	0.625	5.365
Real Estate Investment / Acre	4	0.332	2.363
Crop Receipts / Acre	5	-0.241	1.669
Interest Exp / Receipts	6	-0.241	1.667
Long Term Debt / Acre	7	0.223	1.538
Off-Farm Income	8	0.213	1.464
Depreciation / Receipts	9	0.210	1.443
NCFI Standard Deviation	10	-0.168	1.145
Family Living Expense	11	-0.140	0.946
Intermediate Term Debt / Acre	12	0.126	0.852
Equipment Investment / Acre	13	-0.123	0.833

*Bold t-statistics are significant at 95%

**Livestock sales account for more than 75% of all farm receipts

Table 7. Financial Factors and Correlation to Success for All Diversified Farms**

Factor	Rank	Correlation	t-statistic*
NCFI / Acre	1	0.612	5.364
Expense / Receipts	2	-0.546	4.515
Debt / Assets	3	-0.284	2.050
Family Living Expense	4	-0.225	1.600
NCFI Standard Deviation	5	-0.211	1.498
Off-Farm Income	6	0.181	1.276
Interest Exp / Receipts	7	-0.146	1.021
Real Estate Investment / Acre	8	-0.119	0.827
Intermediate Term Debt / Acre	9	0.070	0.487
Depreciation / Receipts	10	-0.048	0.330
Long Term Debt / Acre	11	0.044	0.307
Equipment Investment / Acre	12	-0.033	0.226
Crop Receipts / Acre	13	0.017	0.116

*Bold t-statistics are significant at 95%

**Farm can not be classified as primarily crop or livestock

The level of real estate investment per acre is only a significant factor for livestock operations, and in that group the intensity of investment ranks as the fourth most important factor. The correlation is positive suggesting that the livestock ranches with highest valued land

are more likely to be successful and/or that owning is preferred to leasing when it comes to ranch land real estate. In all other groups the real estate investment per acre has an insignificant, but negative correlation coefficient. Likewise the top ranking performers overall have the least investment per acre of productive capacity. Though statistically insignificant, the factors of family living expense and off-farm income rank unusually high for the diversified group relative to all other operations.

A qualitative assessment of the factors critical to success can be evaluated from the empirical experience of extension specialist working personally with subscribers to the FARM Assistance analysis system. The FARM Assistance process requires an intensive interviewing process to collect the necessary data to project the financial performance of a farm or ranch. During the interview process, extension specialists collect production information such as yield and weaning weights, as well as direct and indirect expense expectations and future production plans. Another critical part of the process is defining alternative scenarios the producer would like to analyze.

Through personal contact and intensive work with these producers, FARM Assistance specialists have observed two key qualitative indicators of success. The first is the ability of the producer to communicate the essence of his operation and how well he “knows” his own operation. Included in this factor is the producer’s general ability to answer simple questions like, “how much do you spend on seed/fertilizer per acre?” Experience seems to indicate that adequate record keeping is important, but not absolutely essential. There are producers with inadequate records that have a very good knowledge of their operation, as well as producers with good records that really don’t understand their operation. The second qualitative factor has to do with the identification and analysis of future alternative operating strategies. The ability of a farm or ranch manager to be forward looking has been a flag for success. The forward-looking

producers are constantly developing alternative strategies, plans, and options for the future. The less successful producers generally don't think about the future beyond the current year. When asked about alternative strategies to analyze with a FARM Assistance projection, the producers with the fewest ideas tend to be less successful. In general, the producers that have several long-range plans they want analyzed are more financially successful.

Financial success can be measured in a number of ways. The method provided in this analysis attempts quantify the projected success of a farm or ranch. The objective analysis supports the traditional thinking that efficiency, profitability, and a manageable debt level have the most influence in determining financial success. These three factors were determined to have the largest correlation to projected success. Through empirical experience, the farm management qualities most indicative of success are in-depth knowledge of the operation and a forward thinking approach to farm management.